

$$\text{Area} = \int_a^b (f(x) - 0) dx + \int_b^c (0 - f(x)) dx$$

$$= \int_a^b f(x) dx + \int_b^c -f(x) dx$$

$$= \int_a^b f(x) dx - \int_b^c f(x) dx \quad \textcircled{A}$$

Deriv.

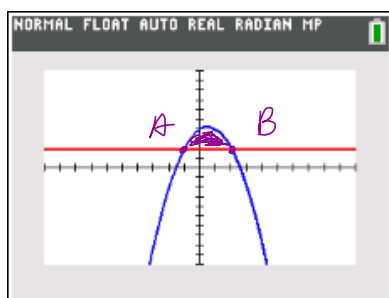
\textcircled{X}

$$\begin{array}{c} 3x^2 \\ \swarrow \quad \downarrow \\ 3 \quad \rightarrow \quad 2x \\ \quad \quad \quad 6x \end{array}$$

Anti-der

$$\begin{array}{c} 2x^2 \\ \swarrow \quad \downarrow \\ 2 \quad \rightarrow \quad \frac{x^3}{3} \\ \frac{2x^3}{3} \end{array}$$

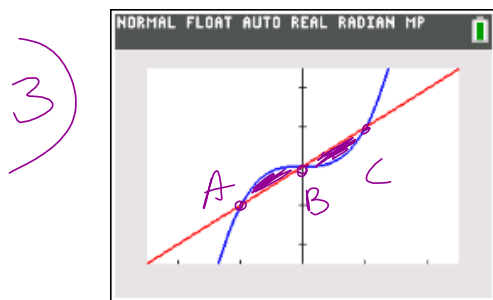
2)



$$A = -1$$

$$B = 2$$

$$\text{Area} = \int_A^B (-x^2 + x + 4 - (2)) dx = \frac{9}{2} \text{ (D)}$$

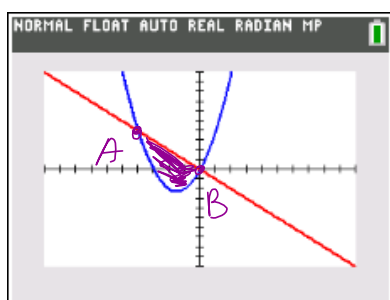


$$\begin{aligned}A &= -1 \\B &= 0 \\C &= 1\end{aligned}$$

$$\text{Area} = \int_A^B (x^3 + 5 - (x + 5)) dx + \int_B^C (x + 5 - (x^3 + 5)) dx = \frac{1}{2}$$

(C)

4)

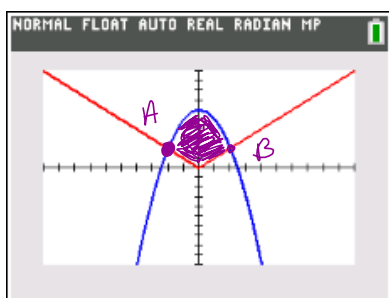


$$A = -4$$

$$B = 0$$

$$\text{Area} = \int_{-4}^0 (-x - (x^2 + 3x)) dx = \frac{32}{3} \quad \textcircled{C}$$

5)

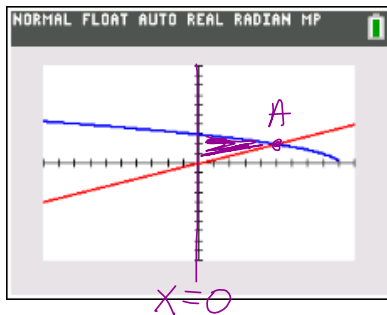


$$A = -2$$

$$B = 2$$

$$\text{Area} = \int_{-2}^2 (6 - x^2 - (|x|)) dx = \boxed{\frac{44}{3} \text{ units}^2}$$

6)

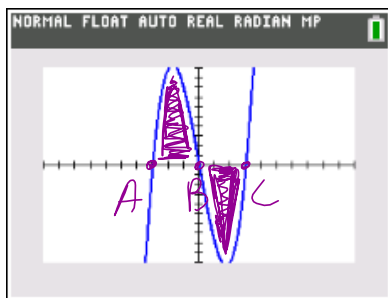


$$A = 5$$

$$\begin{aligned} 2x - 5y &= 0 \\ -5y &= -2x \\ y &= \frac{2x}{5} \end{aligned}$$

$$\text{Area} = \int_0^5 \left(\sqrt{9-x} - \left(\frac{2x}{5} \right) \right) dx = \boxed{\frac{22}{3} \text{ units}^2}$$

7)



$$x^3 - 9x = 0$$

$$x(x^2 - 9) = 0$$

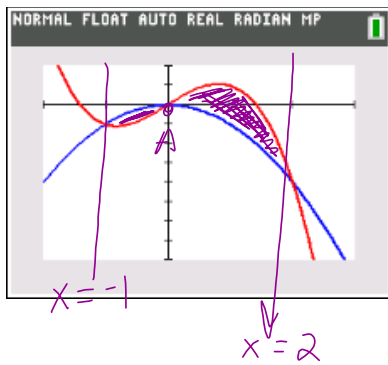
$$x(x+3)(x-3) = 0$$

$$x=0 \quad x=-3 \quad x=3$$

B A C

$$\text{Area} = \int_{-3}^0 (x^3 - 9x) dx + \int_0^3 (0 - (x^3 - 9x)) dx = \boxed{\frac{81}{2} \text{ units}^2}$$

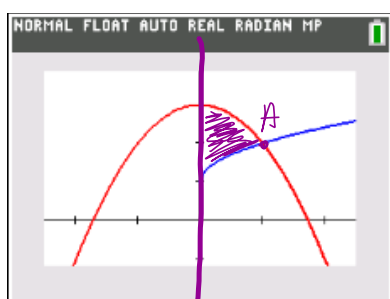
8)

 $A = 0$

$$\text{Area} = \int_{-1}^0 \left(-x^2 - (2x - x^3) \right) dx + \int_0^2 \left(2x - x^3 - (-x^2) \right) dx$$

$$\text{Area} = \boxed{\frac{37}{12} \text{ units}^2}$$

9)



$$A = 1$$

$$\text{Area} = \int_0^1 (3 - x^2 - (\sqrt{x} + 1)) dx = \boxed{1 \text{ unit}^2}$$

$$10) \quad y = 4 - x^2$$

$$x = 4 - y^2$$

$$x - 4 = -y^2$$

$$-x + 4 = y^2$$

$$\pm \sqrt{-x + 4} = y$$

$$y = \sqrt{-x + 4}$$

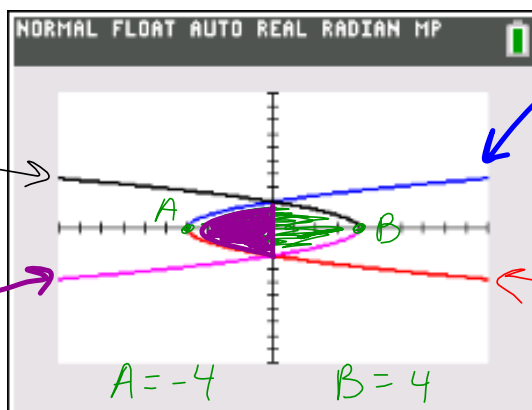
$$y = -\sqrt{-x + 4}$$

$$y = x^2 - 4$$

$$x = y^2 - 4$$

$$x + 4 = y^2$$

$$\pm \sqrt{x + 4} = y$$



$$\text{Area} = \int_{-4}^0 (\sqrt{x+4} - (-\sqrt{x+4})) dx + \int_0^4 (\sqrt{-x+4} - (-\sqrt{-x+4})) dx$$

$$\text{Area} = \boxed{\frac{64}{3} \text{ units}^2}$$